4. Alignment and Adjustments

4-1 General Alignment Instructions

1. Usually, a color TV-VCR needs only slight touch-up adjustment upon installation. Check the basic characteristics such as height, horizontal and vertical sync and focus.

2. Observe the picture for good black and white details. There should be objectionable color shading; if color shading is present, demagnetize, perform purity and convergence adjustments described below.

3. Use the specified test equipment or its equivalent.

4. Correct impedance matching is essential.

5. Avoid overload. Excessive signal from a sweep generator might overload the front-end of the TV. When inserting signal markers, do not allow the marker generator to distort test results.

6. Connect the TV only to an AC power source with voltage and frequency as specified on the backcover nameplate.

7. Do not attempt to connect or disconnect any wires while the TV is turned on. Make sure that the power cord is disconnected before replacing any parts.

8. To protect against shock hazard, use an isolation transformer.

4-2 Automatic Degaussing

A degaussing coil is mounted around the picture tube, so that external degaussing after moving the TV should be unnecessary. But the receiver must be properly degaussed upon installation.

The degaussing coil operates for about 1 second after the power is switched ON. If the set is moved or turned in a different direction, the power should be OFF for at least 10 minutes.

If the chassis or parts of the cabinet become magnetized, poor color purity will result. If this happens, use an external degaussing coil. Slowly move the degaussing coil around the faceplate of the picture tube and the sides and front of the receiver. Slowly withdraw the coil to a distance of about 6 feet before turning power OFF.

If color shading persists, perform the following Color purity and Convergence adjustments.

4-3 High Voltage Check

CAUTION : There is no high voltage adjustment on this chassis. The B+ power supply should be +135 volts (with full color- bar input and normal picture level).

1. Connect a digital voltmeter to the second anode of the picture tube.

2. Turn on the TV. Set the Brightness and Contrast controls to minimum (zero beam current).

3. Adjust the Brightness and contrast controls to both extremes. Ensure that the high voltage does not exceed 30 KV under any conditions.

4-4 FOCUS Adjustment

1. Input a black and white signal.
2. Adjust the tuning control for the clearest picture.
3. Adjust the FOCUS control for well defined scanning lines in the center area of the screen.

4-5 SCREEN Adjustment

1. Input Toshiba Pattern
2. Enter “Service Mode”.(Refer to “4-8-1 Service Mode”)
3. Select “G2-Adjust”.
4. Set the values as below.

Table 1. Screen Adjustment Table

No	INCH / CRT	IBRM	WDRV	CDL	COLR G B (Smallest Value)
1	21PF/TOSHIBA	220	35	180	65
2	21” 1.7R/SDI	220	35	180	100
3	21” 1.7R/JCT	220	35	200	150
4	15 PF/SDI	220	35	180	100

5. Turn the SCREEN VR until “MRCR G B” and “MRWDG” are green and those value are about 100. (The incorrect SCREEN Voltage may result that “MRCR G B” and “MRWDG” should be red)

4-6 E²PROM (IC902) Replacement

1. When IC902 is replaced, all adjustment data revert to the initial values.
   So, all adjustment values when servicing should be readjusted.
2. After IC902 is replaced, connect the AC power supply cord.
3. Turn the power switch ON.
4. In stand-by, warm up the TV for at least 10 seconds.
5. Power on the TV.

4-7 White Balance Adjustment

■ Equipment : Color-Analyzer (CA-100)
■ Input Signal : Pattern signal (Toshiba pattern)

1. Select STANDARD from the menu.
2. Input an 100% White pattern.
3. Enter the “Service Mode”. (Refer to “4-8 Service Mode”)
4. Warm up the TV set at least for 30 minutes.
5. Input a Toshiba pattern signal.
6. Enter the “Video Adjust1”. (Refer to table 2.)
   - Adjust “Sub Contrast” so that Y (luminance) becomes 65 ft ± 3.
   - Use “Red Drive” and “ Blue Drive” to adjust High-Light (x : 265, y : 265)
   - Adjust “Sub Bright” so that Y (luminance) becomes 1.2ft ± 0.3.
   - Use “Red Cutoff” and “Blue Cutoff” to adjust Low-Light (x : 265, y : 265).
7. Adjust CA-100 so that the final adjustment value can be fixed.
8. Use the Channel Up / Down (▲ / ▼) buttons to move the cursor on the adjustment modes.
9. Use the Volume + / - buttons to change the adjustment value.

Table 2. White Balance Table

Area	Inch	High			Low		
		X	Y	Luminance (ft)	X	Y	Luminance (ft)
East South Asia	21PF	265	265	65	265	265	1.2
	21” 1.7R	265	265	60	265	265	1.5
	15PF	265	265	95	265	265	2.0
Middle East Asia & Africa	21PF	290	300	65	290	300	1.2
	21” 1.7R	290	300	55	290	300	1.5
CIS	21PF	272	270	65	265	266	2.7

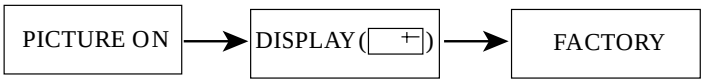
4-8 Factory Adjustment

4-8-1 Service Mode

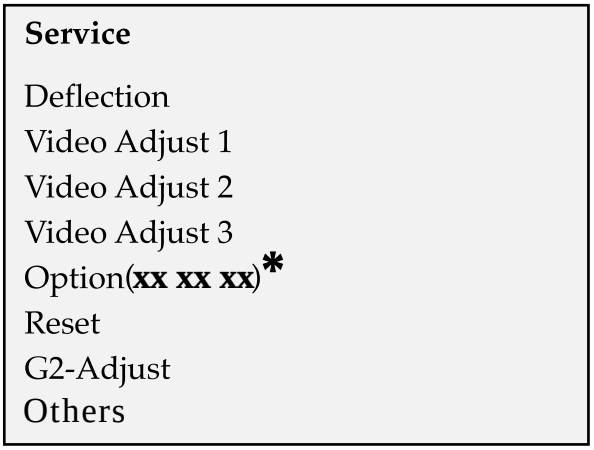
1. To enter the "Service Mode", Press the remote-control keys in this sequence :

   - If you do not have Factory remote-control

   - If you have Factory remote-control



2. After the Service Mode is entered, the initial screen is as shown in the figure below.



✱ These hexa digits are check sum value which depends on the MICOM version.
If check sum value is changed, the value of E^2PROM Data newly initialed.

3. Use the Channel Up / Down buttons to move the cursor in the adjustment parameters.

   Note :

   - When CRT, CRT PCB, FBT, E^2PROM (sometimes MICOM) is replaced, the adjustment values should be controlled.

   - After the Service adjustment is completed, Do not select "Reset" in the service mode menu. (After above procedure is done, power is on initially and the "Plug and Play" will be operated.)

4-8-2 Deflection (Memory Data)

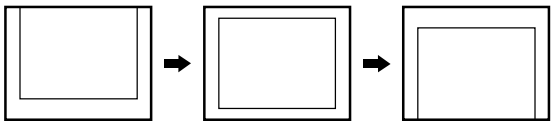
4-8-2(A) GEOMETRIC ADJUSTMENT VALUE

Fixed Value

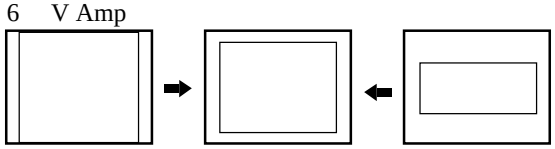
No.	OSD	Range	Initial Value	Function	Remark
1	V Shift	-128 ~ 127	-54	Vertical Shift	
2	V Amp	-128 ~ 127	15	Vertical Amplitude	
3	V Slope	-128 ~ 127	-2	Vertical Slope	
4	V SC	-128 ~ 127	-15	Vertical S-Correction	
5	H EW	-128 ~ 127	61	Horizontal East West Width	
6	H Trapizium	-128 ~ 127	-8	Horizontal Trapezium	
7	H Parabola	-128 ~ 127	-3	Horizontal Parabora	
8	H Symmetry	-128 ~ 127	12	Horizontal Symmetry	
9	H Corner	-128 ~ 127	-32	Horizontal Corner	
10	H Shift	-128 ~ 127	10	Horizontal Shift	
11	PIP Contrast	0 ~ 15	0	PIP Contrast	PIP Option
12	PIP Tint	0 ~ 63	0	PIP Tint (Hue)	
13	PIP H.Move	0 ~ 7	0	PIP Horizontal Move (PIP Picture)	
14	PIP V.Move	0 ~ 7	3	PIP Vertical Move (PIP Picture)	
15	PIP PAL V.Pos	0 ~ 255	33	PIP PAL System Verical Position (PIP Box)	
16	PIP NTSC V.Pos	0 ~ 255	33	PIP NTSC System Vertical Position (PIP Box)	
17	PIP H.Pos	0 ~ 255	42	PIP Horizontal Position (PIP Box)	

4-8-2(B) SCREEN CHANGE (I2C BUS GEOMETRIC ADJUSTMENT)

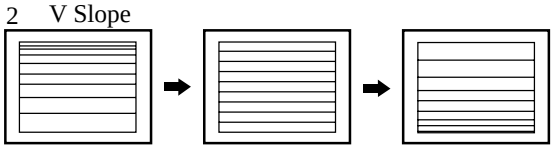
1 V Shift



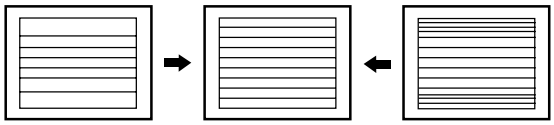
6 V Amp



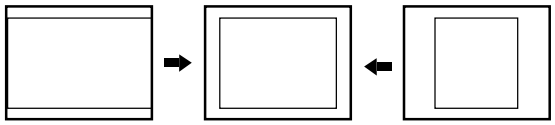
2 V Slope



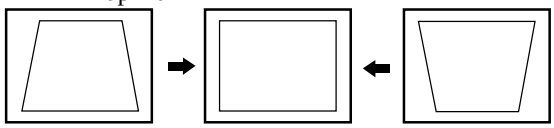
7 V SC



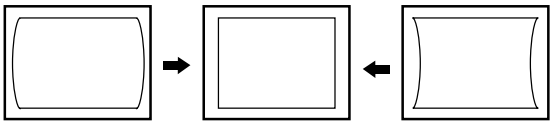
3 H EW



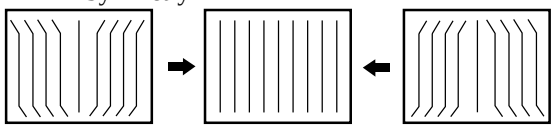
8 H Trapizium



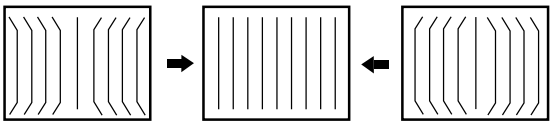
4 H Parabola



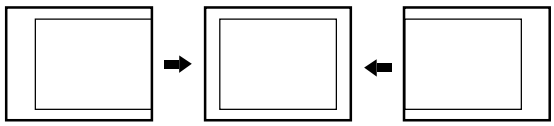
9 H Symmetry



5 H Corner



10 H Shift



4-8-2(C) VIDEO ADJUST 1

Fixed Value

No.	OSD	Range	Initial Value	Function	Remark
1	Red Cufoff	0 ~255	127	Adjust Red Cutoff Level	Low Light
2	Green Cutoff	0 ~255	127	Adjust Green Cutoff Level	
3	Blue Cutoff	0 ~255	127	Adjust Blue Cutoff Level	
4	Red Drive	0 ~255	127	Adjust Red Output Gain	High Light
5	Green Drive	0 ~255	127	Adjust Green Output Gain	
6	Blue Drive	0 ~255	127	Adjust Blue Output Gain	
7	Sub Bright	0 ~ 200	100	Adjust Brightness Level	Low Light
8	Sub Contrast	0 ~ 63	52	Adjust Contrast Level	High Light
9	Sub Color	0 ~ 27	27	Adjust Color Level	Not to be adjusted
10	Sub Tint	0 ~ 100	30	Adjust Tint	
11	BCL Threshold	0 ~ 255	77	Adjust Beam Control Limit Refer to Note 1.	Refer to table 4.
12	BCL Gain	0 ~ 15	8		Not to be adjusted
13	BCL Time	0 ~ 15	13		
14	TTX Contrast	0 ~ 255	90	Adjust OSD/TTX Contrast	Refer to table 4.
15	YC Delay	0 ~ 8	*	Refer to Table 3.	

Note 1. Beam Control Limit Characteristic

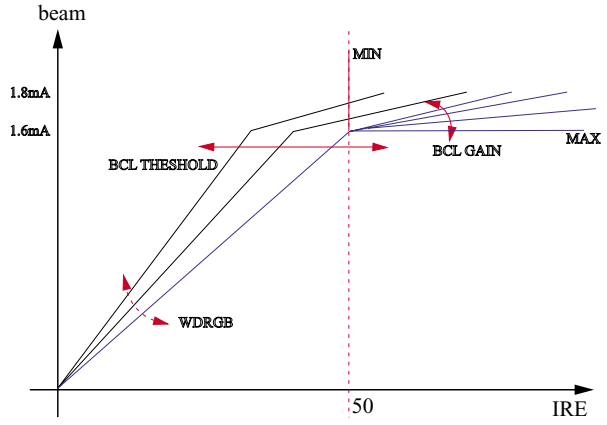


Table 3. YC Delay Adjustment Table

YC Delay	PAL				SECAM				NTSC
	Def.	BG	DK	I	Def.	BG	DK	I	Def.
Value	3	3	6	6	3	3	5	8	0

Table 4. Variable Factory Item

Area	Inch	BCL Threshold	TTX Contrast	Remark
East South Asia	21PF	62	90	
	21” 1.7R	40	90	
	15PF	40	100	
Middle East Asia & Africa	21PF	62	90	
	21” 1.7R	40	90	
CIS	21PF	62	90	

4-8-2(D) VIDEO 2 ADJUST

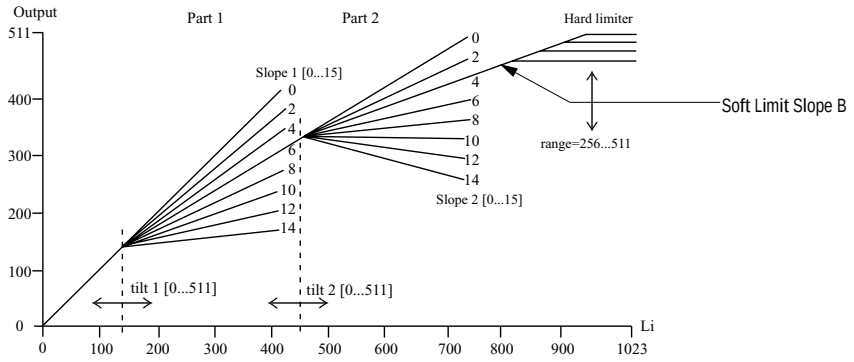
No.	OSD	Range	Initial Value	Function	Remark
1	B stretch-BTHR	0 ~ 55	50	Black Stretch Threshold	
2	B stretch-BTLT	0 ~ 15	8	Black Stretch Tilt Position	
3	B stretch-BAM	0 ~ 31	4	Black Stretch Amount	
4	Coring [1]	0 ~ 31	31	Luma Peaking Filter Coring	
5	RGB Bright	0 ~ 255	0	External RGB Brightness	
6	RGB Contrast	80	0	External RGB Contrastness	
7	EHT Time	0 ~ 15	0	Electronic High Tension Response Time	
8	EHT Compensation	0 ~ 255	60	EHT Compensation Coefficient	

[1] Coring : The Value of Center Frequency for the active bandwidth.

4-8-2(E) VIDEO 3 ADJUST

No.	OSD	Range	Initial Value	Function	Remark
1	Peak Threshold	0 ~ 255	255	White Peak Level Threshold	Refer to Note Below
2	Soft Limit Slope B	0 ~ 15	2	Refer to Picture Below	
3	Hard Limit	0 ~ 255	255		
4	Peak Video Ref	0 ~ 4	0	White Peak Level Threshold Reference	
5	Peak Video Gain	0 ~ 5	0	White Peak Level Threshold Gain	
6	ACC-REF(PAL/NTSC)	0 ~ 20	20	Auto Color Control	
7	ACCR(SECAM)	0 ~ 39	21		

Note 2. Soft Limit & Hard Limit Characteristics



"Soft Limit" is that Limitting the peak white without feed-back, but "Peak Limit" is that with feed-back for white peak level

4-8-2(F) OPTION 1

Micom Spec : SIM-806EA

No.	ITEM(OSD)	Control	Description
1	Language	ESAsia	ENGLISH/VIETNAM/THAI/INDONESIA/MALAYSIA
2	Sound	A2/NICAM	A2 Stereo / Nicam Stereo Model
		Virtual Dolby	Virtual Dolby Model
		Mono	Mono Model
		Line-Stereo	Line stereo Model
3	CRT	4:3	Normal / Zoom / 16:9
		Wide	Wide CRT (16:9)
		Q(12.8:9)	Plus / Normal / Zoom / 16:9
		4:3-16:9	Normal / Zoom
		Q - 16:9	Plus / Normal / Zoom
4	AV Mode	1Scart	Built in 1 Scart Model
		2Scart	Built in 2 Scart Model
		2scart+S	Built in 2 Scart +SVHS JACK Model
		1RCA	Built in RCA 6P / RCA 4P Model
		2RCA	Built in RCA 9P Model
		2RCA+S	Built in RCA 9P + SVHS JACK Model
		2RCA+S+D	Built in RCA 9P + SVHS JACK Model + DVD JACK Model
		2RCA+D	Built in RCA 9P + DVD JACK Model
5	X-Ray	On	X-ray detection function on
		Off	X-ray detection function off
6	Tilt Control	On	CRT Tilt control function on (wide / 29PF CRT)
		Off	CRT Tilt control function off
7	Auto FM	On	automatic change from NICAM to FM depends on NICAM error rate
		Off	automatic change from NICAM to FM depends on NICAM syncronization
8	PIP	Off	no PIP function
		1 - tuner	1 Tuner PIP function
		2 - tuner	2 Tuner PIP function
9	Txt Language	West Europe	English/German/Skandinavian/Italian French/Spainsh/Czech
		East Europe	Polish/Czech/Rumanian/Slovenian/Croatian/ French/Skandinavian/German/Italian
		Russian	Russian/Ukranian/Estonian/Czech/German/ Lettish/English
		Greek-Turkey	English/Turkey/Greek/French/Skandinavian/German/Spainsh/Italian
		Arabic	English/Arabic/French
		Farsi	English/Farsi/French
		Arab-Hebrew	Arabic/Hebrew
10	LNA	On	Built in LNA Tuner
		Off	Built in Normal Tuner
11	Equalizer	On	Include in Equalizer function (MSP34X0D)
		Off	Without Equalizer function (MSP34X5D)
12	High deviate	On	High deviation mode on MSP34XX
		Off	Normal mode on MSP34XX
13	TTX On/Off	On	TTX Model
		Off	W/O - TTX Model

4-8-2(G) OPTION 2

Micom Spec : SIM-806MA

No.	ITEM(OSD)	Control	Description
1	Language	Arab	English/Arab/French/Pakistan
		Iran	English/Persian/French/Turkey
		Libya	English/Libya/French
		CIS	English/Russia
2	Sound	A2/NICAM	A2 Stereo / Nicam Stereo Model
		Virtual Dolby	Virtual Dolby Model
		Mono	Mono Model
		Line-Stereo	Line stereo Model
3	CRT	4:3	Normal / Zoom / 16:9
		Wide	Wide CRT (16:9)
		Q(12.8:9)	Plus / Normal / Zoom / 16:9
		4:3-16:9	Normal / Zoom
		Q - 16:9	Plus / Normal / Zoom
4	AV Mode	1Scart	Built in 1 Scart Model
		2Scart	Built in 2 Scart Model
		2scart+S	Built in 2 Scart +SVHS JACK Model
		1RCA	Built in RCA 6P / RCA 4P Model
		2RCA	Built in RCA 9P Model
		2RCA+S	Built in RCA 9P + SVHS JACK Model
		2RCA+S+D	Built in RCA 9P + SVHS JACK Model + DVD JACK Model
		2RCA+D	Built in RCA 9P + DVD JACK Model
5	X-Ray	On	X-ray detection function on
		Off	X-ray detection function off
6	Tilt Control	On	CRT Tilt control function on (wide / 29PF CRT)
		Off	CRT Tilt control function off
7	Auto FM	On	automatic change from NICAM to FM depends on NICAM error rate
		Off	automatic change from NICAM to FM depends on NICAM syncronization
8	PIP	Off	no PIP function
		1 - tuner	1 Tuner PIP function
		2 - tuner	2 Tuner PIP function
9	Txt Language	West Europe	English/German/Skandinavian/Italian/French/Spainsh/Czech
		East Europe	Polish/Czech/Rumanian/Slovenian/Croatian/ French/Skandinavian/German/Italian
		Russian	Russian/Ukranian/Estonian/Czech/German/Lettish/English
		Greek-Turkey	English/Turkey/Greek/French/Skandinavian/German/Spainsh/Italian
		Arabic	English/Arabic/French
		Farsi	English/Farsi/French
		Arab-Hebrew	Arabic/Hebrew
10	LNA	On	Built in LNA Tuner
		Off	Built in Normal Tuner
11	Equalizer	On	Include in Equalizer function (MSP34X0D)
		Off	Without Equalizer function (MSP34X5D)
12	High deviate	On	High deviation mode on MSP34XX
		Off	Normal mode on MSP34XX
13	TTX On/Off	On	TTX Model
		Off	W/O - TTX Model

4-8-2(H) OPTION 3

Micom Spec : SIM-806E1

No.	ITEM(OSD)	Control	Description
1	SOUND	A2/NICAM	A2 Stereo / Nicam Stereo Model
		Virtual Dolby	Virtual Dolby Model
		Mono	Mono Model
		Line-Stereo	Line stereo Model
2	CRT	4:3	Normal / Zoom / 16:9
		Wide	Wide CRT (16:9)
		Q(12.8:9)	Plus / Normal / Zoom / 16:9
		4:3-16:9	Normal / Zoom
		Q - 16:9	Plus / Normal / Zoom
3	A/V Mode	1Scart	Built in 1 Scart Model
		2Scart	Built in 2 Scart Model
		2scart+S	Built in 2 Scart +SVHS JACK Model
		1RCA	Built in RCA 6P / RCA 4P Model
		2RCA	Built in RCA 9P Model
		2RCA+S	Built in RCA 9P + SVHS JACK Model
		2RCA+S+D	Built in RCA 9P + SVHS JACK Model + DVD JACK Model
		2RCA+D	Built in RCA 9P + DVD JACK Model
4	X-Ray	On	X-ray detection function on
		Off	X-ray detection function off
5	Tilt Control	On	CRT Tilt control function on (wide / 29PF CRT)
		Off	CRT Tilt control function off
6	Auto FM	On	automatic change from NICAM to FM depends on NICAM error rate
		Off	automatic change from NICAM to FM depends on NICAM syncronization
7	PIP	Off	no PIP function
		1 - tuner	1 Tuner PIP function
		2 - tuner	2 Tuner PIP function
8	LNA	On	Built in LNA Tuner
		Off	Built in Normal Tuner
9	Equalizer	On	Include in Equalizer function (MSP34X0D)
		Off	Without Equalizer function (MSP34X5D)
10	High deviate	On	High deviation mode on MSP34XX
		Off	Normal mode on MSP34XX

4-8-2(I) G2 - ADJUSTMENT

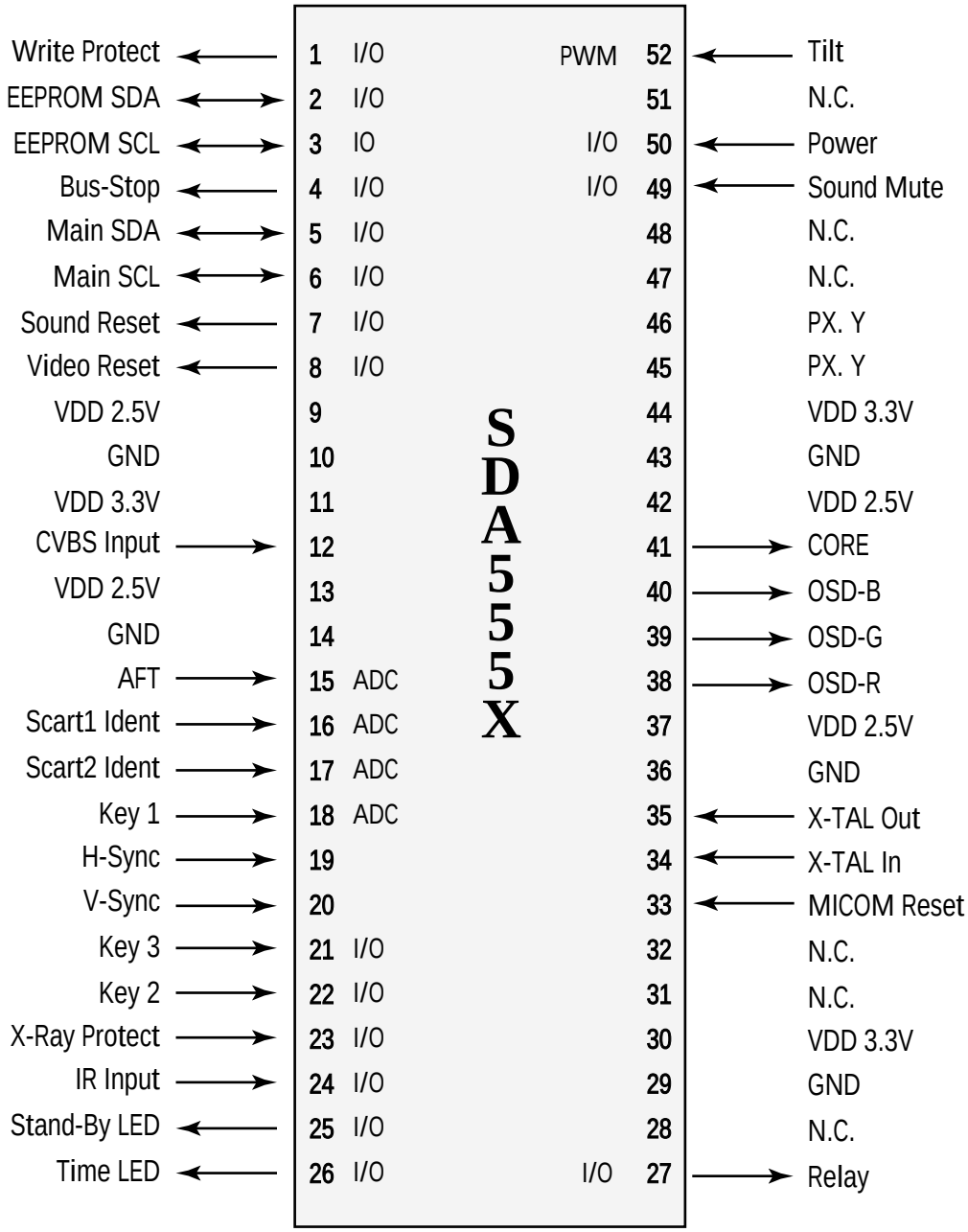
No.	ITEM(OSD)	Control	Description	Initial Value
1	MRCR G B	No Control	Measure of Cutoff Gain	**110 110 110**
2	MRWDG	No Control	Measure of Green Drive Gain	**110**
3	IBRM	0 ~ 255	Internal Brightness offset value by Read Measurement	220 Refer to Screen adjust table
4	WDRV	0 ~ 255	White Drive Value	35
5	CDL	0 ~ 255	Cathode Drive Level	180
6	COLR G B	0 ~ 255	Cathode Cutoff Level	65 70 75

4-8-2(J) OTHERS

No.	ITEM(OSD)	Control	Description	Initial Value
1	VSU	96 ~ 111	Vertical Setup TIme (Large Value time)	108
2	H QEW	-30 ~ 30	Horizontal EW data offset to plus screen	0
3	H Zoom Parabola	-15 ~ 15	Horizontal Palabola offset to zoom screen	8
4	H 16:9 Parabola	-15 ~ 15	Horizontal Palabola offset to 16:9 screen	-18
5	TTX Position	-30 ~ 30	Horizontal shift in TTX Mode	0
6	Mono Sound System	BG	Initial Sound System of Mono Model	BG
		DK		
		I		
		M		
7	V Slice level	0 ~ 3	Vertical Sync Slice level Setting	2
8	Melody Volume	0 ~ 20	Melody Sound Volume level Setting	5

4-9 MICOM

4-9-1 Pin Layout



4-9-2 Pin Assignment Specification

PIN NO	FUNCTION	ASSIGN	IN/OUT	ACTIVE H/L	DESCRIPTION
1	I/O	Write Protect	Out	Low	EEPROM Write Protection
2	I/O	ROM SDA	I/O		EEPROM Serial Data Line
3	I/O	ROM SCL	I/O		EEPROM Serial Clock Line
4	I/O	Bus Stop	In	Low	Disable Micom IIC
5	I/O	Main SDA	I/O		Peripheral IC Serial Data Line
6	I/O	Main SCL	I/O	Low	Peripheral IC Serial Clock Line
7	I/O	Sound Reset	Out	Low	MSP IC Initial Control
8	I/O	Video Reset	Out		VDP IC Initial Control
9	Vdd	VDD 2.5V			
10	GND				
11	Vdd	VDD 3.3V			
12	CVBS	CVBS Input	In		TTX CVBS Input
13	Vdd	VDD 2.5V			Analog B+
14	GND				Analog Ground
15	ADC	AFT	In		Auto Fine Tuning Control
16	ADC	SC1-ID	In		Scart1 Ident
17	ADC	SC2-ID	In		Scart2 Ident
18	ADC	Key1	In		Key1 Input
19	HS	H-Sync	In		Horizontal Sync Input
20	VS	V-Sync	In		Vertical Sync Input
21	I/O	Key3	In		Key3 Input
22	I/O	Key2	In		Key2 Input
23	I/O	X-Ray	In		X-Ray Protection
24	I/O	IR-In	In		Remocon Signal Input
25	I/O	STD-LED	Out		LED Drive Output(Red)
26	I/O	TIM-LED	Out		LED Drive Output(Green)

4-9-2 Pin Assignment Specification (Continued)

PIN NO	FUNCTION	ASSIGN	IN/OUT	ACTIVE H/L	DESCRIPTION
27	I/O	Relay	Out	Low	Activate Degausssing Coil
28	N.C.				Not Used (Programmed Gound Level)
29	GND				Analog Ground
30	Vdd	VDD 3.3V			Not Used (Programmed Gound Level)
31	N.C.				Not Used (Programmed Gound Level)
32	N.C.				Micom Hardware Reset
33	Reset	Reset	In	Low	Crystal Oscillation Input
34	X-In	X-TAL In	In	6MHz	Crystal Oscillation Output
35	X-Out	X-TAL Out	Out	6MHz	Analog Ground
36	GND				Analog B+
37	Vdd	VDD 2.5V			OSD/TTX Output (Red)
38	R	OSD-R	Out		OSD/TTX Output (Green)
39	G	OSD-G	Out		OSD/TTX Output (Blue)
40	B	OSD-B	Out		Fast Blank/Half Contrast Output
41	COR	CORE	Out		
42	Vdd	VDD 2.5V			
43	GND				
44	Vdd	VDD 3.3V			
45	I/O	PX.Y	In		When The Caption Function Adopted, Used.
46	I/O	PX.Y	Out		
47	N.C.				Not Used (Programmed Gound Level)
48	N.C.				
49	I/O	S-Mute	Out	High	Sound Amp Mute
50	I/O	Power	Out	Low	Picture On/Off Control
51	N.C.				Not Used (Programmed Gound Level)
52	I/O				